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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of: **Yasuyuki NAKAJIMA et al.** Group Art Unit: **2154**

Application Number: **09/657,368** Examiner: **Larry D. Donaghue**

Filed: **September 7, 2000** Confirmation No.: **2481**

For: **APPARATUS AND METHOD FOR COMPRESSION-TRANSMITTING AND DECODING PICTURE INFORMATION AND STORAGE MEDIUM STORED ITS CONTROL PROGRAMS**

Attorney Docket Number: **001162**
Customer Number: **38834**

SUBMISSION OF APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

October 28, 2005

Sir:

Applicants submit herewith an Appeal Brief in the above-identified U.S. patent application.

Attached please find a check in the amount of $500.00 to cover the cost for the Appeal Brief.

If any additional fees are due in connection with this submission, please charge our Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP

William M. Schertler
Attorney for Appellants
Registration No. 35,348
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPEAL BRIEF FOR THE APPELLANT

Ex parte **Yasuyuki NAKAJIMA et al.** (applicant)

APPARATUS AND METHOD FOR COMPRESSION-TRANSMITTING AND DECODING PICTURE INFORMATION AND STORAGE MEDIUM STORED ITS CONTROL PROGRAMS

Application Number: **09/657,368**

Filed: **September 7, 2000**

Appeal No.:

Group Art Unit: **2154**

Examiner: **Larry D. Donaghue**

William M. Schertler
Registration No. 35,348
Attorney for Appellants

WESTERMAN, HATTORI,
DANIELS & ADRIAN, LLP
1250 Connecticut Avenue NW, Suite 700
Washington, D.C. 20036
Tel (202) 822-1100
Fax (202) 822-1111

Date: **October 28, 2005**

BRIEF ON APPEAL

(I) REAL PARTY IN INTEREST

The real party in interest is **KDD CORPORATION**, by an assignment recorded in the U. S. Patent and Trademark Office on September 7, 2000, at Reel 011085, Frame 0649.

(II) RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to appellant, appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(III) STATUS OF CLAIMS

Pending claims 1-3 and 14 stand rejected. Claims 4-13 and 15-33 have been withdrawn from consideration as being directed to a non-elected invention. No claims are allowed or objected to. The claims on appeal are 1-3 and 14

(IV) STATUS OF AMENDMENTS

No amendments were filed subsequent to the final rejection.

(V) SUMMARY OF THE INVENTION

There are two independent claims on appeal in this application, apparatus claim 1 and method claim 14.

The present invention is directed to an apparatus and method wherein live picture information can be efficiently transmitted to a network in a real-time manner. More particularly, according to the present invention, a transmission timing control section 15 does not transmit data to a network for a time during which a real-time encoder 11 writes data into a frame buffer 12. As a result, it is possible to incorporate a network output processing into the processing loop of the real-time encoder 11. Further, compared with a conventional method in which FIFO is used and another process for network output is started, it is possible to realize a network output processing with simple packaging. Still further, by extending the transmission time for transmitting frame data to the network to a time at which the next frame is written into the buffer, it is possible to avoid burst transmission of frame data packets to the network compared with a conventional direct transmission method and to thereby suppress the generation of packet loss and to improve transmission efficiency (see application specification, page 16, line 17 – page 17, line 5).

Claim 1

The invention recited in claim 1 is a real-time picture information compression-transmission apparatus for compression transmitting picture information in a real-time manner (see, e.g., the block diagram in Fig. 1 of appellants' application).

The real-time picture information compression-transmission apparatus comprises an input means for receiving said picture information (e.g., element 10, Fig. 1); and an encoder (e.g., element 11, Fig. 1) encoding frames of said picture information from the input means on a preset cycle in a real-time manner and outputting real-time-encoded data corresponding to respective frames of said picture information (see, e.g., page 12, lines 15-19 of appellants' specification).

The real-time picture information compression-transmission apparatus also comprises a storage means for storing said real-time-encoded data corresponding to the respective frames of said picture information output from the encoder (e.g., element 12, Fig. 1), the encoder writing the real-time-encoded data corresponding to the respective frames into the storage means (see, e.g., page 12, lines 15-19 of appellants' specification); a division means (e.g., element 13, Fig. 1) for receiving the real-time encoded data corresponding to respective frames from the storage means and sequentially dividing said real-time-encoded data corresponding to the respective frames into packets (see, e.g., page 12, line 19 – page 13, line 22 of appellants' specification); and

a transmission timing control and transmission means (e.g., element 14, Fig. 1) for controlling transmission timing to sequentially transmit the packets corresponding to the respective frames to a network (see, e.g., page 13, line 23 – page 14, line 3 of appellants' specification), wherein the packets corresponding to respective frames are transmitted to the network during a period after said encoder writes real-time encoded data corresponding to a frame to the storage means and before said encoder writes real-time encoded data corresponding to a next frame to the storage means (see, e.g., page 14, line 4 – page 17, line 5 of appellants'

specification), and for transmitting the packets to the network according to a connection-less type protocol (see, e.g., page 7, lines 12-13 of appellants' specification).

Claim 14

Method claim 14 corresponds to apparatus claim 1. The invention recited in claim 14 is a real-time picture information compression-transmission method for compression-transmitting picture information in a real-time manner. The method comprises an encoding step of encoding said picture information on a preset cycle in a real time manner (see, e.g., page 12, lines 15-19 of appellants' specification); a storage step of writing and storing real-time-encoded frame data on said picture information for each frame (see, e.g., page 12, lines 15-19 of appellants' specification); a division step of sequentially dividing said real-time-encoded data into packets for each frame (see, e.g., page 12, line 19 – page 13, line 22 of appellants' specification); and a transmission timing control and transmission step of controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data (see, e.g., page 13, line 23 - page 17, line 5 of appellants' specification), and of transmitting the packets to the network according to a connection-less type protocol (see, e.g., page 7, lines 12-13 of appellants' specification).

(VI) ISSUES TO BE REVIEWED ON APPEAL

Appellants appeal the final rejection of claims 1 and 14 under 35 U.S.C. §102(e) as being anticipated by **Yano et al.** (U.S. Patent No. 6,701,732). Appellants appeal the final rejection of claims 2 and 3 under 35 U.S.C. §103(a) as being unpatentable over **Yano et al.** in view of **Boyce** (U.S. Patent No. 6,490,705).

(VII) ARGUMENT

Appellants explain herein why the claim rejections should be reversed. Each rejection is addressed individually.

The rejection of claims 1 and 14 under 35 U.S.C. §102(e) as being unpatentable over Yano et al. should be reversed.

As will be discussed in detail below, appellants submit that the rejection under §102(e) is improper and should be reversed because the **Yano et al.** reference does not disclose each and every element and step recited in the claims.

Anticipation under §102 is established only if all the elements of an invention, as stated in the claim, are identically set forth in a single prior art reference. Moreover, it is not sufficient that each element be found somewhere in the reference, the elements must be "arranged as in the claim." *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick Co.*, 703 F.2d 1452, 1458 (Fed. Cir. 1984).

Yano et al. does not disclose each and every claimed element exactly as claimed and therefore the rejection is improper under §102

Claims 1 and 14 are argued separately with respect to this argument

Claim 1

Throughout the prosecution of this application, applicants have argued that **Yano et al.** do not disclose or suggest the claimed "*transmission timing control and transmission means for controlling transmission timing to sequentially transmit packets corresponding to the respective frames to a network, wherein packets corresponding to respective frames are transmitted to the network during a period after said encoder writes real-time encoded data corresponding to a frame to the storage means and before said encoder writes data corresponding to a next frame to the storage means, and for transmitting the packets to the network according to a connection-less type protocol*, as recited in claim 1.

First, **Yano et al.** does not disclose or suggest that packets are transmitted to the network according to a connection-less type protocol. As described in col. 4, lines 57-63 of **Yano et al.**, the data transfer rate in the data transmitter 1-12 is determined by the receiver report from the receiving terminal 1-2. This corresponds to a connection-oriented protocol. In contrast, the claimed transmission timing control and transmission means transmits packets to the network using a connection-less type protocol. According to a connection-less type protocol, transmission timing is determined without using a receiver report from a receiving terminal.

In the previous Office Actions, the Examiner cited col. 2, line 66 – col. 2, line 7 of **Yano et al.** as teaching a connection-less type protocol (it is assumed that the Examiner meant "col. 3, line 7"). However, this section of **Yano et al.** relates to the types of networks in which the **Yano et al.** apparatus is applicable, and is silent regarding a connection-less type protocol.

Therefore, **Yano et al.** does not disclose or suggest all of the elements of the invention recited in claim 1. Accordingly, the rejection under §102 is improper and should be withdrawn for at least the above reasons.

Second, **Yano et al.** do not disclose or suggest *"transmission timing control and transmission means ...wherein packets corresponding to respective frames are transmitted to the network during a period after said encoder writes real-time encoded data corresponding to a frame to the storage means and before said encoder writes data corresponding to a next frame to the storage means, ..."* as recited in claim 1.

In the most recent Office Action, the Advisory Action mailed July 13, 2005, the Examiner responds to the previously presented patentability arguments asserting "Col. 13, lines 38-43 set forth the video generator sets a given time for the video capture, i.e., write timing for the encoder. Col. 3, line 65 - col. 4, line 6, set forth that after completion of the transmission, the process of data generation and transmission is repeated." The Advisory Action further adds "The [cited] passage set[s] forth video capture, which would include the interval to [encode] and store the frame."

Col. 13, lines 38-43 of **Yano et al.** cited by the Examiner state:

> "The video data generator 1001-11 sets a given time in a timer for video data capture (step S1201). This time is determined in correspondence with the video frame transmission interval calculated by the rate adjustor 1001-13. If the time set in the timer has been reached (step 1202), video data is captured (step S1203)."

The above passage is silent regarding writing data from an encoder to a storage means. Furthermore, there is no disclosure or suggestion in the above passage (or in **Yano et al.**) that packets corresponding to respective frames are transmitted to the network during a period after said encoder writes real-time encoded data corresponding to a frame to a storage means and before said encoder writes data corresponding to a next frame to the storage means.

Yano et al. discloses that the data generator 1001-11, which includes an image sensing unit and a unit for compressing and encoding sensed video data, determines the ***capture timing*** of video data of a next frame to be "just in time with" the ***frame transmission timing*** designated by a rate adjuster 1001-13 (col. 12, lines 29-35). As shown in Fig. 13, after the video capture time is reached (S1202), video data is captured (S1203), compression coded (S1204) and passed to a data transmitter (S1205). The data transmitter 1001-12 segments the received data into packet data, and adjusts the transmission bit rate to that designated by a rate adjuster 1001-13 (col. 12, lines 38-44).

Thus, **Yano et al.** does not disclose or suggest a storage means, as claimed, that receives encoded data and passes the encoded data to a division means to divide the encoded data into packets. In contrast, as shown in Fig. 13 of **Yano et al.**, the captured data is captured at a specified capture timing, encoded and passed directly to the data transmitter 1001-12 that divides

the received data into packet data. There is no disclosure in **Yano et al.** of a storage means that receives the captured data before passing the data to the data transmitter 1001-12.

Further, **Yano et al.** does not disclose or suggest that packets corresponding to respective frames are ***transmitted to the network*** during a period after said encoder writes real-time encoded data corresponding to a frame to a storage means and before said encoder writes data corresponding to a next frame to the storage means.

The rate adjustor 1001-13 determines the ***frame transmission start timing*** and transmission bit rate on the basis of the data volume and reception rate calculated by the network buffer data volume calculator 1001-14, and designates the ***frame transmission start timing*** to the video data generator 1001-11 and the bit rate to the data transmitter 1001-12 (col. 12, lines 48-54). More specifically, the ***frame transmission start timing*** and transmission bit rate are calculated based on ***network buffer data volume***. That is, a reception condition on the receiving side is reported to the transmitting side to predict the volume of data that has not reached the receiving side. The volume of "unarrived" data on the network is referred to as "network buffer data volume." See, e.g., col. 11, line 45 – col. 12, line 8; col. 13, lines 19-21 and col. 14, lines 41-49. As indicated in Fig. 17, the start of transmission of a new video frame to the network occurs when the network buffer data volume is zero.

Thus, unlike the claimed invention, according to **Yano et al.** the frame transmission start timing is controlled according to network buffer data volume and not according to write timing of encoded data to a storage means.

However, even assuming, *arguendo*, that the data generator 1001-11 of **Yano et al.** stored encoded data in a storage means, this would not result in the presently claimed invention. Specifically, as indicated above, **Yano et al.** discloses that the data generator 1001-11 determines the ***capture timing*** of video data of a next frame to be *"just in time with"* the ***frame transmission timing*** designated by a rate adjuster 1001-13 (col. 12, lines 29-35). Therefore, if, assuming *arguendo*, the video capture of **Yano et al.** corresponds to an encoder writing to storage, as asserted in the Advisory Action, then **Yano et al.** would write a next frame of video data to storage ***at the same time*** as transmitting a frame of video data to the network.

In contrast, the claimed invention transmits packets to the network ***during a period after said encoder writes real-time encoded data corresponding to a frame to the storage means and before said encoder writes data corresponding to a next frame to the storage means (i.e., data is not transmitted to the network for the time during which the real time encoder writes data to the storage).***

For all the reasons set forth above, it is submitted that **Yano et al.** does not disclose, either explicitly or inherently, all of the elements recited in claim 1. Therefore, the rejection of claim 1 under §102 is improper and should be withdrawn. Appellants request that the Board reverse the rejection under §102 for the above reasons.

Claim 14

Claim 14 recites a method corresponding to apparatus claim 1.

It is submitted that **Yano et al.** does not disclose or suggest "transmitting the packets to the network according to a connection-less type protocol," as recited in claim 14, for the same reasons set forth above with respect to the corresponding portion of apparatus claim 1.

Further, it is submitted that **Yano et al.** do not disclose or suggest "controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data," as recited in claim 14, for the same reasons set forth above with respect to the corresponding portion of apparatus claim 1.

For all the reasons set forth above, it is submitted that **Yano et al.** does not disclose, either explicitly or inherently, all of the elements recited in claim 14. Therefore, the rejection of claim 14 under §102 is improper and should be withdrawn. Appellants request that the Board reverse the rejection under §102 for the above reasons.

The rejection of claims 2 and 3 under 35 U.S.C. §103(a) as being unpatentable over Yano et al. in view of Boyce should be reversed.

As will be discussed in detail below, appellants submit that the rejection under §103(a) is improper and should be reversed because the combination of the **Yano et al.** and **Boyce** references does not disclose each and every element and recited in the claims.

As set forth in the Manual of Patent Examining Procedure (MPEP), Eighth Edition, Revision 2, May 2004, §2143.03 "To establish *prima facie* obviousness of a claimed invention,

all the claim limitations must be taught or suggested by the prior art." *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

The combination of the Yano et al. and Boyce references does not teach or suggest all the claim limitations recited in claims 2 and 3 and therefore the rejection is improper under §103 Claims 2 and 3 are argued separately with respect to this argument

Claim 2

It is submitted that **Yano et al.** do not disclose or suggest that the transmission timing for transmitting the packets corresponding to respective frames to the network is determined from an encoded frame interval and a frame data storage time, as recited in claim 2. Further, **Boyce** does not teach this feature, and therefore the combination of references does result in the invention recited in claim 2.

The Examiner states "As to claim 2, **Yano et al.** [teaches] the transmission timing for transmitting the divided packets to the network is determined from an encoded frame interval and a frame data storage time" citing column 13, lines 38-45 of **Yano et al.** (see final Office Action mailed March 1, 2005, page 3, lines 1-3).

However, column 13, lines 38-45 of **Yano et al.** is related to a video data generator 1001-11, which includes an image sensing unit and a unit for capturing, compressing and encoding sensed video data (see column 12, lines 30-32). Specifically, column 13, lines 38-45 of **Yano et al.** discusses how the video data generator 1001-11 captures image data and is *unrelated to transmission timing for transmitting divided packets to a network.* Further, the rate adjustor

1001-13 determines the ***frame transmission start timing*** and transmission bit rate on the basis of the data volume and reception rate calculated by the network buffer data volume calculator 1001-14.

Thus, contrary to the Examiner's assertion, **Yano et al.** do not disclose or suggest that the transmission timing for transmitting the packets corresponding to respective frames to the network is determined from an encoded frame interval and a frame data storage time, as recited in claim 2. Further, **Boyce et al.** do not alleviate this deficiency of **Yano et al.**

In view of the above, it is submitted that the combination of the **Yano et al.** and **Boyce** references does not teach or suggest all the claim limitations recited in claim 2 and therefore the rejection is improper under §103. Appellants request that the Board reverse the rejection of claim 2 under §103 for the above reasons.

Claim 3

It is submitted that neither **Yano et al.** nor **Boyce** disclose or suggest the division means, as recited in claim 3, for dividing each frame data into the packets such that a payload size of a transmitted UDP packet corresponds to a value obtained by subtracting an IP header size and a UDP header size from an Ethernet maximum transfer unit; and the number of UDP packets divided from a K-th frame corresponds to a value obtained by dividing a data size, in bytes, of the K-th frame by the payload size, in bytes, of the transmitted UDP packet.

The final Office Action cites column 8, lines 65-66 and column 9, lines 35-39 of **Boyce** for disclosure of these features. Furthermore, the final Office action states "As to claim 3, **Yano**

et al. [teaches] for transmitting the packets to the network is set so that a transmission time, in seconds, for transmitting the K-th frame data to the network corresponds to a value obtained by subtracting a write time, in seconds, for which said encoder writes the K-th frame data into said storage means, from a frame interval, in seconds, between the K-th frame data and the (K+1)th frame data" again citing column 13, lines 38-45 of **Yano et al.** (see final Office Action page 3, lines 10-14).

As noted above, column 13, lines 38-45 of **Yano et al.** is unrelated to transmission timing for transmitting packets to a network and does not disclose or suggest the specific manner for determining the transmission time.

Still further, **Boyce** does not disclose or suggest the division means, as recited in claim 3, for dividing each frame data into the packets such that a payload size of a transmitted UDP packet corresponds to a value obtained by subtracting an IP header size and a UDP header size from an Ethernet maximum transfer unit; and the number of UDP packets divided from a K-th frame corresponds to a value obtained by dividing a data size, in bytes, of the K-th frame by the payload size, in bytes, of the transmitted UDP packet. The Office Action cites column 8, lines 65-66 and column 9, lines 35-39 of **Boyce** for disclosure of these features.

Boyce discusses setting the maximum packet size for Internet Protocol (IP) transmission to the Ethernet Maximum Transport Unit (MTU) (see column 8, lines 65-67), and discusses that a maximum packet size is equal to the Ethernet MTU size minus the number of packet header bytes used (column 9, lines 38-39). However, **Boyce** does not specifically disclose subtracting an IP header size and a UDP header size from an Ethernet maximum transfer unit.

In view of the above, it is submitted that the combination of the **Yano et al.** and **Boyce** references does not teach or suggest all the claim limitations recited in claim 3, and therefore the rejection is improper under §103. Appellants request that the Board reverse the rejection of claim 3 under §103 for the above reasons.

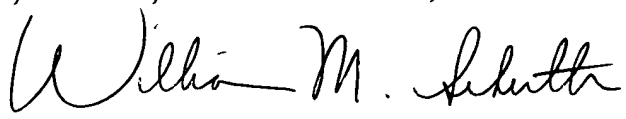
(VIII) CONCLUSION

For the above reasons, appellant requests that the Board of Patent Appeals and Interferences reverse the Examiner's rejections of claims 1-3 and 14.

If this paper is not timely filed, appellants hereby petition for an appropriate extension of time. The fee for any such extension may be charged to our Deposit Account No. 50-2866, along with any other additional fees that may be required with respect to this paper.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



William M. Schertler
Attorney for Applicants
Registration No. 35,348
Telephone: (202) 822-1100
Facsimile: (202) 822-1111

WMS/dlt

Enclosures: Claims appendix
Evidence appendix
Related proceedings appendix

CLAIMS APPENDIX

1. A real-time picture information compression-transmission apparatus for compression transmitting picture information in a real-time manner, comprising:

input means for receiving said picture information;

an encoder encoding frames of said picture information from the input means on a preset cycle in a real-time manner and outputting real-time-encoded data corresponding to_respective frames of said picture information;

storage means for storing said real-time-encoded data corresponding to the respective frames of said picture information output from the encoder, the encoder_writing the real-time-encoded data corresponding to the respective frames into the storage means;

division means for receiving the real-time encoded data corresponding to respective frames from the storage means and sequentially dividing said real-time-encoded data corresponding to the respective frames into packets; and

transmission timing control and transmission means for controlling transmission timing to sequentially transmit the packets corresponding to the respective frames to a network, wherein packets corresponding to respective frames are transmitted to the network during a period after said encoder writes real-time encoded data corresponding to a frame to the storage means and before said encoder writes real-time encoded data corresponding to a next frame to the storage means, and for transmitting the packets to the network according to a connection-less type protocol.

2. A real-time picture information compression-transmission apparatus according to claim 1, wherein

the division means for dividing the data corresponding to respective frames into the packets, divides said real-time-encoded data corresponding to respective frames into packets in size suited for an Ethernet maximum transfer unit; and

the transmission timing for the transmitting the packets corresponding to respective frames to the network is determined from an encoded frame interval and a frame data storage time.

3. A real-time picture information compression-transmission apparatus according to claim 1, wherein

the division means for dividing the real-time-encoded data corresponding to respective frames into the packets divides the respective frames so that:

a payload size of a transmitted UDP packet corresponds to a value obtained by subtracting an IP header size and a UDP header size from an Ethernet maximum transfer unit; and

the number of UDP packets divided from a K-th frame corresponds to a value obtained by dividing a data size, in bytes, of the K-th frame by the payload size, in bytes, of the transmitted UDP packet; and

the transmission timing, controlled by said transmission timing control and transmission means, for transmitting the packets to the network is set so that a transmission time, in seconds,

for transmitting the K-th frame data to the network corresponds to a value obtained by subtracting a write time, in seconds, for which said encoder writes the K-th frame data into said storage means, from a frame interval, in seconds, between the K-th frame data and a (K + 1)th frame data.

14. A real-time picture information compression-transmission method for compression-transmitting picture information in a real-time manner, comprising:

an encoding step of encoding said picture information on a preset cycle in a real time manner;

a storage step of writing and storing real-time-encoded frame data on said picture information for each frame;

a division step of sequentially dividing said real-time-encoded data into packets for each frame; and

a transmission timing control and transmission step of controlling transmission timing to sequentially transmit the divided packets to a network after a write time for storing said frame data for the packets and before a time for storing next frame data, and of transmitting the packets to the network according to a connection-less type protocol.

EVIDENCE APPENDIX

No evidence under 37 C.F.R. § 41.37(c)(1)(ix) is submitted.

RELATED PROCEEDING APPENDIX

No decisions under 37 C.F.R. § 41.37(c)(1)(x) are rendered.